REMARKS

In the Office Action, the Examiner rejected all pending claims 23, 25-28 and 30. By the present Response, Applicants have amended claims 23, 25-28 and 30 to clarify features of the present techniques. No new material was introduced by way of these amendments. After amendment, claims 23, 25-28, and 30 remain pending in the present application. Applicants respectfully request reconsideration of the application in view of the amendments and the remarks set forth below.

Claim Rejections under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 23 and 25-28 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Although Applicants do not agree that the claims were indefinite as written, Applicants have amended the claims to eliminate the transitional phrase "consisting essentially of." Accordingly, Applicants respectfully assert that the rejection under the second paragraph of 35 U.S.C. § 112 is moot and request that the Examiner withdraw the rejection.

Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 25-28 and 30 under 35 U.S.C. § 102(b) as being anticipated by Marks *et al.* (U.S. Patent No. 6,235,918, hereinafter "Marks"). The Examiner also rejected claims 26-28 and 30 under 35 U.S.C. § 102(e) as being anticipated by McCullough *et al.* (U.S. Patent No. 6,900,1544, hereinafter

"McCullough"). Further, the Examiner rejected claims 26 and 30 under 35 U.S.C. § 102(b) as being anticipated by McDaniel *et al.* (U.S. Patent No. 6,355,594, hereinafter "McDaniel"). Finally, the Examiner rejected claim 30 under 35 U.S.C. § 102(b) as being anticipated by Lin *et al.* (WO 02/16480, hereinafter "Lin"). Applicants respectfully traverse these rejections.

Legal Precedent and Guidelines

Anticipation under 35 U.S.C. § 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 227 U.S.P.Q. 773, 778 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). To maintain a proper rejection under 35 U.S.C. § 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention "*in as complete detail as contained in the ... claim*" to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989)(emphasis added).

If the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in

the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson,* 49 U.S.P.Q.2d 1949, 1950-51 (Fed. Cir. 1999). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy,* 17 U.S.P.Q.2d 1461, 1464 (B.P.A.I. 1990). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.*

Further, while some older courts were critical of negative limitations, the "current view of the courts is that there is nothing inherently ambiguous or uncertain about a negative limitation." M.P.E.P. § 2173.05(i), p. 2100-228 (8th Ed., Rev. 6, Sep. 2007). Moreover, word-for-word literal support in the specification is not required for negative claim limitations, if the specification conveys that the applicants had possession of the concept at the time of filing. *See Ex parte Parks*, 30 U.S.P.Q.2d 1234, 1236 (B.P.A.I. 1993). For example, "[i]f *alternative* elements are *positively recited* in a specification they may be explicitly *excluded* in the claims." M.P.E.P. § 2173.05(i)(emphasis added). Indeed, it has long been held that an applicant is entitled to claim "less then the full scope of his disclosure." *In re Johnson*, 194 U.S.P.Q. 187, 195 (C.C.P.A. 1971).

Deficiencies of Marks

In rejecting claims 25-28 and 30 as anticipated by Marks, the Examiner specifically stated:

> Marks *et al.* discloses preparation of sulfated zirconia supported on silica (col. 3, lines 24-30) which qualifies as "silica-zirconia" solid oxide of the instant claims. Metallocenes used for preparation of catalyst include $CpTiMe_3$, Cp * $TiMe_3$ (Cp * = 1 5-pentamethylcyclopentadienyl) Cp_2ZrMe_2, Cp^*HfMe_2, Cp^*ZrMe_3, and $CGCZrMe_2$. Preparation of catalysts containing these compounds contacted with sulfated silica-zirconia is immediately envisioned.

Office Action, p. 2.

As amended, independent claim 25 does not recite the metallocene catalysts disclosed by Marks. Specifically, claim 25 is amended to delete $Cp_2Zr(CH_3)_2$ as a catalyst that may be used. As noted above, Applicants may claim less than the full scope of their disclosure. Accordingly, Applicants believe the rejection of claim 25 as anticipated by Marks to be moot, and respectfully request that the Examiner withdraw the rejection.

Although, as discussed below, Applicants do not agree with the Examiner that Marks discloses a silica-zirconia, as in the present claims, independent claim 26 has been amended to exclude this element in an effort to advance prosecution. As discussed above, if an element is recited as an option, it may be excluded in the claims. M.P.E.P. § 2173.05(i). Thus, as silica-zirconia is positively listed as a solid oxide that may be

included in a catalyst composition, it may be explicitly excluded. *See* Specification, p. 22, ll. 12-15. Accordingly, because silica-zirconia is excluded in claim 26, as amended, Applicants believe the rejection to be moot, and respectfully request that the Examiner withdraw the rejection of claim 26 as anticipated by Marks.

Furthermore, Applicants respectfully disagree with the Examiner that the "sulfated zirconia supported on silica," as described by Marks, is the same material as the solid mixed oxide "silica-zirconia" recited in independent claims 27, 28, and 30 of the present application. *See* Marks, col. 3, l. 24. Marks provides a procedure for the formation of the silica supported material which involves slurrying a fumed silica gel with a zirconyl nitrate and urea solution to precipitate $Zr(OH)_4$ onto the silica. *Id.*, col. 3, ll. 25-28. After drying, the $Zr(OH)_4/SiO_2$ formed is slurried with 1N H_2SO_4, and calcined. *Id.*, col. 3, ll.29-31. One of ordinary skill in the art would recognize that this procedure would form a surface layer of sulfated zirconia over (i.e., supported on) the silica, as described by Marks.

In contrast, the silica-zirconia recited in claims 27, 28, and 30 is a "mixed-oxide." The specification describes the mixed-oxides as "single chemical phases with more than one metal combined with oxygen to form a solid oxide compound." Specification, p. 21, ll. 8-10. The specification also provides examples of these mixed metal oxides, which includes "silica-alumina, silica-titania, silica-zirconia, zeolites, clays, alumina-titania, alumina-zirconia, aluminum phosphate, heteropolytungstates, and the like." *Id.* at p. 22,

ll. 12-15 (emphasis added). This mixed-oxide may be later sulfated by treatment with an electron-withdrawing anion source, followed by calcining to form the chemically-treated solid oxide. *Id.* at p. 22, ll. 16-25. Thus, as the chemically-treated solid oxide is a single phase, the outer surface may have both sulfated silica and sulfated zirconia present. One of ordinary skill in the art would not expect this to perform identically to a sulfated zirconia supported on silica, as disclosed in Marks. Accordingly, the Examiner has not shown that the silica-zirconia recited in the present claims is necessarily present in the teachings of Marks.

For at least the reasons discussed above, Marks does not disclose all of the elements of claims 25-28, and 30 and, thus, cannot anticipate these claims. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 102(b) and allow the claims to issue.

Deficiencies of McCullough

In rejecting claims 26-28 and 30 as anticipated by McCullough, the Examiner specifically stated:

> McCullough *et al.* teaches catalysts containing metallocene and fluorided metal oxide support containing a halogenated aromatic aluminum compound covalently bound to the surface of said support (claim 1). Support materials include silica, alumina, zinc oxide, boria, aluminum phosphate, magnesia, and mixtures thereof (col. 4, lines 60-65). Representative metallocenes include Cp*TiBz3, Cp*TiMe3, (1,3 -BuMeCp)$_2$ZrMe$_2$, Me$_2$Si(2-Melnd)$_2$ZrMe$_2$, and Cp * $_2$ZrMe$_2$, (col. 9, line 57-col. 10,

> line 15). Catalyst A contains $(1,3\text{-BuMeCp})_2ZrMe_2$ and fluorided silica.

Office Action, p. 4 (emphasis added).

In McCullough, a halogenated aromatic aluminum compound is used with metallocene catalysts to produce a polyolefin. McCullough, col. 17, ll. 56-58. McCullough does not disclose making a polymer in the absence of the halogenated aromatic aluminum compound. *See id.*, col. 2, l. 64-col. 3, l. 9. Further, McCullough describes these compounds as activators, stating that "the term 'halogenated aromatic aluminum activator' means an activator comprising at least one aromatic group (e.g., fluorine), and at least one aluminum compound, wherein the halogen is bound to the aromatic group." *Id.*, col. 3, ll. 20-24. As noted in the present application, "[o]ften metallocene compounds are used in catalyst compositions along with activating cocatalysts" (i.e., activators), and that it is of interest "to develop metallocene-based catalytic systems that polymerize olefins without the need for cocatalysts." Specification, p. 1, ll. 27-34 (emphasis added).

In the present application, independent claims 26-28, and 30 recite "wherein the catalyst composition is substantially free of cocatalysts, organoboron compounds, or ionizing ionic compounds." (Emphasis added). As discussed above, items that are positively recited in a specification may be explicitly excluded in a claim. M.P.E.P. § 2173.05(i).

Accordingly, as McCullough does not disclose a catalyst composition that is free of a cocatalyst, i.e., the halogenated aromatic aluminum compound, McCullough cannot anticipate claims 26-28, and 30. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of these claims under 35 U.S.C. § 102(e) and allow the claims to issue.

Deficiencies of McDaniel

In rejecting claims 26 and 30 as anticipated by McDaniel, the Examiner specifically stated:

> McDaniel *et al.* teaches a catalyst composition prepared by contacting organometal compound, fluorided silica-alumina, and *organoaluminum compound* (col. 11, lines 32-35). The organometal compound $Et(Ind)_2ZrMe_2$ is a preferred compound for use as a catalyst component (col. 5, line 20). In this case, the catalyst consists essentially of contact product and metallocene and chemically treated solid oxide wherein the chemically treated solid oxide comprises a solid oxide treated with an electron-withdrawing anion as well as organoaluminum. Clearly, organoaluminum is in contact with the solid oxide, and therefore, the solid oxide is treated not only with fluoride, but also with the organoaluminum.

Office Action, pp. 4-5 (emphasis added).

Independent claims 26 (as amended) and 30 recite "wherein the catalyst composition is substantially *free* of an organoaluminum compound having the formula: $Al(X^5)_n(X^6)_{3-n}$ wherein (X^5) is a hydrocarbyl having from 1 to about 20 carbon atoms;

wherein (X^6) is a halide, hydride, or alkoxide; and wherein n is a number from 1 to 3 inclusive." (Emphasis added). Again, so long as an element is positively recited it may be explicitly excluded. The specification describes organoaluminum compounds as compounds that may be included in the catalyst compositions and, thus, may be excluded in the claims. Specification, p. 28, ll. 3-4; ll. 14-21.

In contrast to the recitations of the present claims, McDaniel does not disclose making a catalyst composition that does not contain an organo-aluminum compound. As stated in McDaniel, "[t]he process comprises . . . contacting an organometal compound, an organoaluminum compound, and a fluorided silica-alumina to produce the catalyst composition." McDaniel, col. 1, ll. 59-63 (emphasis added). Accordingly, McDaniel does not disclose all of the elements of claim 30 and, thus, cannot anticipate this claim.

For at least the reasons discussed above, Applicants assert that McDaniel cannot anticipate claims 26 and 30 of the present application. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 26 and 30 under 35 U.S.C. § 102(b) and allow the claims to issue.

Deficiencies of Lin

In rejecting claim 30 as anticipated by Lin, the Examiner specifically stated that "Lin *et al.* discloses preparation of a catalyst comprising contacting fluorided silica with

$Me_2Si(2\text{-}Me\text{-}4\text{-}Phlnd)_2ZrMe_2$ and $B(C_6F_5)_3$ see col. 20, lines 5-17. This catalyst is substantially free of organoaluminum compound." Office Action, p. 5.

As amended, claim 30 recites "wherein the catalyst composition is substantially free of cocatalysts, organoboron compounds, or ionizing ionic compounds." (Emphasis added). As previously discussed, elements that are positively recited in the specification may be explicitly excluded in the claims.

In contrast to claim 30, the catalyst composition of Lin cited by the Examiner includes organoboron compounds as described in the present specification. *See* Specification, p. 32, ll. 28-31 (noting that "the term fluoroorgano boron compounds has its usual meaning to refer to neutral compounds of the form BY_3."). The specific compound cited by the Examiner in Lin, $B(C_6F_5)_3$, is disclosed as an organoboron compound in the present specification. *See id.*, p. 33, ll. 10-12 ("Examples of fluoroorgano boron compounds . . . include, but are not limited to, tris(pentafluorophenyl)boron."). Thus, the organoboron compounds of Lin are specifically excluded by the present claims.

For the reasons discussed above, Applicants assert that Lin does not anticipate claim 30. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 102(b) and allow claim 30 to issue.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 25, 26, and 30 under 35 U.S.C. § 103(a) as being unpatentable over Saudemont *et al.* (U.S. Patent No. 6,239,059, hereinafter "Saudemont"). The Examiner rejected claims 25-28 and 30 under 35 U.S.C. § 103(a) as being unpatentable over McCullough in view of Naganuma *et al.* (EP 591 756, hereinafter "Naganuma"). Applicants respectfully traverse these rejections.

Legal Precedent and Guidelines

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (B.P.A.I. 1979). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974). However, it is not enough to show that all the elements exist in the prior art since a claimed invention composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). It is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* Specifically, there must be some articulated reasoning with a rational underpinning to support a conclusion of obviousness; a conclusory statement will not suffice. *In re Kahn,* 441 F.3d 977, 988 (Fed. Cir. 2006). Indeed, the factual inquiry determining whether to combine references

must be thorough and searching, and it must be based on *objective evidence of record. In re Lee,* 61 U.S.P.Q.2d 1430, 1436 (Fed. Cir. 2002).

In addition, it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 123 U.S.P.Q. 349 (C.C.P.A. 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

Deficiencies of Saudemont

In rejecting claims 25, 26 and 30 as obvious over Saudemont, the Examiner admitted that: "[t]he reference does not show catalyst systems in which co-catalyst is not required." Office Action, p. 3. Further, the Examiner stated that the "[c]o-catalysts include alkylaluminum and aluminoxanes (col. 7, lines 35-54)," and contended that "[c]atalysts contacted with these co-catalysts would remain obvious over the instant claims." Office Action, p. 3.

Amended claims 25, 26, and 30 recite, *inter alia*:

> wherein the catalyst composition is substantially free of an organoaluminum compound having the formula:
>
> $$Al(X^5)_n(X^6)_{3-n}$$
>
> wherein (X^5) is a hydrocarbyl having from 1 to about 20 carbon atoms;
>
> wherein (X^6) is a halide, hydride, or alkoxide; and
>
> wherein n is a number from 1 to 3 inclusive;
>
> wherein the catalyst composition is substantially free of cocatalysts, organoboron compounds, or ionizing ionic compounds.

In contrast, Saudemont discloses no catalyst compositions that produce polymer in the absence of these co-catalysts or organoaluminum compounds. Indeed, as noted above, the Examiner has admitted that Saudemont does not show a catalyst composition in which a co-catalyst is not required. Office Action, p. 3. While the Examiner has stated that "[t]he co-catalyst component is not required where the metallocene catalyst is pre-alkylated," the Examiner has not cited any passages within Saudemont that indicate this to be the case. *Id.* Indeed, all examples provided in Saudemont show the addition of a co-catalyst to the polymerization. *See* Saudemont, Tables 1-7.

Furthermore, Saudemont provides no indication that any of the disclosed catalysts would even function to produce polymer without the presence of a co-catalyst. Indeed, most of the catalysts disclosed are metallocene dihalo complexes, which, as noted in the present specification, would not produce polymer without cocatalysts. *See* Saudemont, col. 6, l. 44-col. 7, l. 33 (listing a majority of species with the format $(metallocene)_2(Metal)Cl_2$); Specification, p. 2, ll. 5-13 (noting that the presence of at

least one hydrocarbyl ligand is needed for activity without cocatalysts). Saudemont also provides no reason to modify the catalyst systems by the elimination of the cocatalyst.

The Examiner has not only provided no explanation within Saudemont that would indicate that Saudemont could be modified in this manner, but is apparently relying only on the teachings of the present application. As held in *KSR*, discussed above, it is important for the Examiner to *articulate a reason* that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does, such as producing a polyolefin in the absence of co-catalysts. Accordingly, Applicants respectfully assert that Saudemont cannot make present claims 25, 26, and 30 obvious.

For at least the reasons discussed above, Applicants assert that claims 25, 26 and 30 of the present application are not obvious over Saudemont. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of the claims under 35 U.S.C. § 103(a) and allow the claims to issue.

Deficiencies of McCullough and Naganuma.

In rejecting independent claims 25-28 and 30 as obvious over McCullough in view of Naganuma, the Examiner specifically stated:

> McCullough *et al.* teaches that useful catalysts are prepared with compounds disclosed in Naganuma *et al.* EP-A-0 591 756 (col. 10, line 20). The foreign reference discloses

> standard metallocene and piano-stool complexes including $CpZrBz_3$, Cp_2ZrBz_2, $Cp^*_2ZrMe_2$, $Et(Ind)_2ZrMe_2$ (pages 4 and 5). It would have been obvious to one having ordinary skill in the art to use the compounds disclosed in Naganuma *et al.* to make the supported catalysts because McCullough et al. instructs the skilled artisan to prepare such catalysts, and accordingly, the skilled artisan would have expected such a combination to result in the formation of a working, active catalyst. The combination is obvious because McCullough *et al.* discloses use of these compounds for preparing inventive catalysts, and Naganuma *et al.* furnishes the actual identity of these compounds.

Office Action, p. 4.

As discussed with respect to the rejection of claims 26-28 and 30 under 35 U.S.C. § 102, McCullough does not disclose the use of a catalyst composition without a halogenated aromatic aluminum compound cocatalyst and, thus, does not disclose all of the elements of claims 26-28 and 30. For the same reasons, McCullough does not disclose all of the elements of claim 25, which also recites: "wherein the catalyst composition is substantially free of cocatalysts, organoboron compounds, or ionizing ionic compounds." (Emphasis added).

Furthermore, Naganuma does not obviate the deficiencies of McCullough. In contrast, Naganuma discloses a catalyst system that uses "ionic compounds capable of forming an ionic complex when reacted with the transition metal compound." Naganuma, p. 2, ll. 53-54; *see also id.* at p. 6, ll. 24-48 (listing numerous examples of these bulky ionic compounds). These compounds are positively recited in the present

specification as "ionizing ionic compounds." Specification, p. 33, l. 29-p. 36, l. 6 (presenting similar examples showing an overlap of many of the same ions). As previously discussed, an element that is positively disclosed in a specification may be explicitly excluded in the claims. Accordingly, as amended, independent claims 25-28 and 30 explicitly exclude "ionizing ionic compounds" from the catalyst composition.

Therefore, neither McCullough nor Naganuma, either alone in any sort of hypothetical combination, disclose all of the elements of independent claims 25-28 and 30 of the present application. For at least these reasons, Applicants respectfully assert that McCullough, either alone, or in any sort of hypothetical combination with Naganuma cannot make obvious claims 25-28 or claim 30 of the present application. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of these claims under 35 U.S.C. § 103(a) and allow the claims to issue.

Payment of Fees

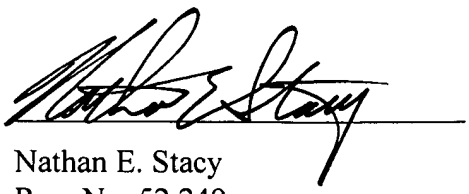
Applicants hereby request a one-month extension in accordance with 37 C.F.R. § 1.136, and provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request thereof. The Commissioner is authorized to charge the requisite fee of $120 for the extension of time to the credit card listed on the attached PTO-2038. If the PTO-2030 is missing, if the amount listed thereon is insufficient, or if the amount is unable to be charged to the credit card for any other reason, the Commissioner is authorized to charge Deposit Account No. 06-1315; Order No. CPCM:0047/FLE/FAR/STA (210462US00).

Conclusion

In view of the amendments and remarks set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: July 31, 2008



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